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Before the
Subcommittee on Military Procurement
Committee on Armed Services
U.S. House of Representatives

June 27, 2001

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to testify on the Department of Energy (DOE) National Nuclear Security Administration=s (NNSA) Fiscal Year (FY) 2002 budget request. The overall request – including Defense Programs, Defense Nuclear Nonproliferation, Naval Reactors, and the Administrator=s Office – totals $6.8 billion.

The Defense Programs (DP) FY 2002 budget request is $5.3 billion, an increase of 4.6 percent over the comparable appropriated FY 2001 level. This budget will support (1) all scheduled maintenance, evaluation, and certification activities for the current stockpile, while deferring some decisions on future refurbishment workload; (2) manufacture of a certifiable W88 with a newly manufactured pit in FY 2003, with no commitment to a certification schedule or to production quantities; (3) maintenance of all current facilities and sites at approximately the current level of funding; (4) maintenance of current management and operating (M&O) contractor employment levels for ongoing programs; (5) maintenance of secure transportation and nuclear weapon incident response assets at approximately their current levels; (6) current requirements for weapons safeguards and security, while undertaking a limited cyber security initiative; and (7) maintenance of federal staffing levels at the current, on-board level, including re-consolidation of NNSA federal landlord, safeguards, and security staffs. Specific line items include Directed Stockpile Work ($1,043,791,000), Campaigns ($1,996,413,000), Readiness in Technical Base and Facilities ($1,446,988,000), Secure Transportation Asset ($121,800,000), Safeguards and Security ($448,881,000), and Program Direction ($271,137,000).

The Defense Nuclear Nonproliferation (NN) FY 2002 request is $773.7 million. This is a decrease from the 2001 budget, but this does not represent a lessening of our commitment to meeting the ever-growing challenges faced in the international nonproliferation or threat reduction arena. The request does cover the funding needed to support a broad range of nonproliferation goals. These include: (1) international nuclear safety, (2) detecting the proliferation of weapons of mass destruction, (3) preventing the spread of nuclear materials, technology, and expertise, and (4) eliminating inventories of surplus fissile material usable for nuclear weapons. Specific line items include Nonproliferation and Verification Research and Development ($206,102,000), International Nuclear Safety ($13,800,000), Highly Enriched Uranium (HEU) Transparency Implementation ($13,950,000), Arms Control and

Nonproliferation ($101,500,000), International Materials Protection, Control and Accounting ($138,800,000), Fissile Materials Disposition ($248,089,000), and Program Direction ($51,459,000).

The Naval Reactors (NR) FY 2002 budget request is $688,045,000, virtually unchanged from the FY 2001 appropriated amount. This budget will support planned activities for Naval Reactors Development, including Plant Technology, Reactor Technology and Analysis, Materials Development and Verification, Evaluation and Servicing, Facility Operation, and Construction. In real terms, the NR budget is decreasing about $18,000,000 due to inflation. This decrease reflects progress toward completing major inactivation work on the S3G and D1G prototype reactor plants at the Kesselring site, along with the final phase of the Windsor site inactivation and cleanup work. Specific line items include Naval Reactors Development ($665,445,000) and Program Direction ($22,600,000).

The FY 2002 budget request for the Office of the Administrator of the NNSA is $15 million. The Department of Energy is required by various laws to enhance U.S. national security through the military application of nuclear technology, and to reduce global danger from the proliferation of weapons of mass destruction. The NNSA, a semi-autonomous Administration within the Department, carries out these responsibilities. Established in March 2000, pursuant to Title 32 of the National Defense Authorization Act for FY 2000 (Public Law 106-65), the NNSA is structured to provide clear and direct lines of accountability and responsibility for the management and operation of the nation=s nuclear weapons, naval reactors, and nuclear nonproliferation activities.

In January 2001, President Bush asked the Secretary of Defense, in coordination with the Secretary of Energy, to conduct a Strategic Defense Review to create a new vision for the role of the nation=s military in the 21st century. Completion of this review will certainly impact the FY 2002 and out-year budgets for defense and national-security-related activities. The Administration plans to determine the final FY 2002 and out-year funding requests when the Strategic Defense Review is complete. As Secretary Abraham indicated in his statement on April 9, 2001, concerning the DOE FY 2002 Budget Request to Congress, "While awaiting the policy shaped by the Strategic Defense Review, we will refocus funding to meet vital national security needs, including investments to maintain our nuclear weapons arsenal, shore up an aging weapons infrastructure, and improve safeguards and security at all DOE facilities." I am here today to describe those efforts and the progress we have made since the NNSA was created.

STANDING UP THE NNSA

As you know, the NNSA has formed for just over one year. As the NNSA Administrator, this is my first opportunity to appear before the Subcommittee to discuss the NNSA budget request. Before providing a detailed presentation of our budget, based on our key goals and strategies for attaining those goals, let me share with you my observations about the nation=s nuclear security enterprise and some of the accomplishments the NNSA has achieved during its short existence.

I begin by emphasizing that our focus is on our mission, as Congress defined it in the NNSA enabling legislation **B** Title 32 of the the National Defense Authorization Act for Fiscal Year 2000. Title 32 contains six mission objectives:

1. To enhance United States national security through the military applications of nuclear energy.
2. To maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements.
3. To provide the United States Navy with safe, militarily effective nuclear propulsion plants and to ensure the safe and reliable operations of those plants.
4. To promote international nuclear safety and non-proliferation.
5. To reduce the nuclear danger from weapons of mass destruction.
6. To support United States leadership in science and technology.

The NNSA=s mission is to strengthen national security and reduce the global threat from weapons of mass destruction, through the application of science and technology. While standing up the NNSA has proceeded more slowly than I would have liked, we are fulfilling our mission every day in our laboratories, production facilities, test site, and, yes, even in remote parts of the world, where we pursue our nonproliferation goals. And, my friend Admiral Bowman oversees 102 naval nuclear reactors, helping underwrite American military presence and deterrence around the globe.

OBSERVATIONS

Over the six months, I have traveled to all of the national defense laboratories, the production plants, and the federal field offices. I have met many of the men and women who make up the NNSA. Based on my observations and interactions, I am very impressed with the dedication our team brings to their work and our mission; the intelligence and creativity they apply to the highly complex scientific and engineering problems that confront them; and the technical skills they use to maintain the safety, security and reliability of this nation=s aging nuclear weapons stockpile, while addressing the risks of proliferation and use of weapons of mass destruction, and developing the most efficient, safest nuclear reactors ever conceived.

As long as nuclear deterrence remains the cornerstone of our national security strategy and we continue to face the risk of weapons of mass destruction, we must ask nothing less than the continued excellence these people have delivered for more than fifty years. In fact, we must continue to demand more **B** more security, improved health and safety of our workers, more environmentally benign processes, and higher efficiency. They, in turn, deserve our support and our advocacy.

As we discuss budgets, programs, and projects, it is imperative that we not lose sight of the fact that the success of the NNSA depends on these talented and patriotic Americans **B** the technicians, administrative staff, scientists, guards, engineers, maintenance crews, managers, and all the others – who

contribute to the nation=s nuclear defense. One of my jobs is to make certain that none of us lose sight of this simple fact – we must not jeopardize the success of these programs by making decisions that unnecessarily hinder our people from performing their best work or stifle their creativity or limit their initiative.

I assumed this job at a moment in which the enterprise, as a whole, was struggling with security concerns and questions about its future, and the morale of our people was at an all-time low. While hard to quantify, I sense, and I believe my colleagues and the leadership at the laboratories and production plants would agree, that morale has begun to improve. People are starting to feel better about themselves, their work, their institutions, and the direction in which they see the NNSA moving, especially at the laboratories.

MISSION ACCOMPLISHMENTS

Last year, our overall budget saw its first real growth in many years, and, for that, I thank the Congress. This tangible commitment to our mission by Congress has sent a strong signal that the mission is importatnt and enduring, and has allowed all of us in the enterprise to begin to really look to the future. With these additional funds, we have begun to make marginal improvements. These additional funds will make it easier to attract and retain the next generation of scientists and engineers, to continue to build the needed experimental and computational facilities, and to begin to correct for our aging infrastructure at the production sites and laboratories. Congress authorized an increase in Laboratory Directed Research and Development (LDRD). In FY 2001, we have established a new research and development program, dedicated to improving the efficiency and effectiveness of our production plants.

That said, the NNSA enterprise is still very fragile, and there is much more to do. We are making aggressive, pro-active management decisions to improve our stewardship of the resources provided by the Congress.

The NNSA completed the fifth annual certification of the nuclear weapons stockpile, with the Secretaries of Defense and Energy signed their certification letter on January 11, 2001, for transmission to the President.

Activities are on track to restore the capability of producing tritium, which is required for proper operation of all nuclear-weapon types in the stockpile. On January 1, 2000, a thirty-year interagency agreement with the Tennessee Valley Authority (TVA), making three of its reactors available to begin irradiation of tritium production absorber rods, as early as October 2003. On July 27, 2000, ground was broken for the Tritium Extraction Facility at the Savannah River Site. Delivery of new tritium gas is expected to commence in February 2006.

In concert with the Department of Defense, and through the Nuclear Weapons Council, we now have an agreed upon program to refurbish the B61 bomb and the W76 and W80 warheads, which constitute a significant portion of the stockpile. This work, in addition to the ongoing refurbishment of the W87 intercontinental ballistic missile warhead, is a clear demonstration that stockpile stewardship ***is*** working, and a clear measure of a renewed, much improved relationship with the Department of Defense. At the same time, this planned workload demands resources that are not included in the original Stockpile Stewardship Program and demand long-delayed improvements in plant infrastructure, as well.

There are new contracts in place that give NNSA better oversight at our plants and laboratories at Y-12, Pantex, Kansas City, and Los Alamos and Lawrence Livermore National Laboratories.

The approach to solving infrastructure issues is also moving in the right direction. We have begun a Recapitalization Initiative to develop an integrated, prioritized list of maintenance and infrastructure activities that, when completed, will significantly increase the operational efficiency and effectiveness at all of our sites. It is a long-term plan that will allow us to create a weapons complex that is properly sized, using modern technologies to protect the health and safety of our workers and communities, without creating a legacy of hazardous waste and distrust that we do not want, nor can we afford. This plan will increase the operational readiness of facilities, reduce non-productive facility downtime and high costs associated with unplanned corrective maintenance, arrest the continuing deterioration of facilities, extend the useful lifetimes of current facilities.

NNSA has rebaselined the work at the National Ignition Facility. There has been a major turnaround in the management of this once-troubled program, and I have recently certified to Congress that the program is on schedule and within budget. We are making progress in plutonium pit manufacturing and certification, although there are serious issues ahead of us. Directed Stockpile Work has made enormous leaps, and is providing the thousands of parts needed to keep the nuclear stockpile safe, secure, and reliable. The Advanced Simulation and Computing program (formerly the Accelerated Strategic Computing Iniative [ASCI]) is continuing, on track, to provide the world-class computing and simulation tools required to maintain the stockpile, now and into the future. The Nevada Test Site continues to conduct experiments, subcritical and others, that are providing valuable data on the health of the nuclear weapons stockpile, and are exercising skills necessary to maintain test readiness.

We have begun implementing AIntegrated Safeguards and Security Management@ in the NNSA. ISSM, as it is known, will build safeguards and security considerations into management and work practices, at all levels, so missions are accomplished securely. It is designed to involve the individuals performing work in the process of establishing appropriate safeguards and security practices. Subject matter experts are available to provide guidance and information, but we must place the responsibility for working securely squarely on the shoulders of every individual in our complex – the scientists, technicians, production workers, and professionals performing and managing our missions.

NNSA has been hard at work to secure and dispose of nuclear warhead materials, at home and abroad. We are establishing methods to help prevent the unthinkable from happening – the use of weapons of mass destruction in an attack on this country or our citizens. NNSA=s world-class expertise at its national laboratories is vital to the success of this effort.

Since 1993, the Materials Protection, Control and Accounting (MPC&A) program has formed a first line of defense by working with Russia to improve the security of weapons-usable material at ninety-five sites. By the end of the current fiscal year, the program will have completed rapid security upgrades for nearly 4,000 Russian Navy nuclear warheads and an additional 220 metric tons of HEU and plutonium located in Russia and the Newly Independent States – enough material to make roughly 20,000 nuclear devices. In addition, our Second Line of Defense (SLD) Program is improving Russia=s ability to detect and interdict nuclear smuggling, by installing radiation detection equipment at key Russian border crossings, including three seaports and two airports.

NNSA is helping to prevent the proliferation of weapons-usable material, while significantly reducing long-term storage costs for these materials in the U.S. Under the materials disposition program, the U.S. and Russia are implementing an agreement, signed in September 2000, to permanently dispose of sixty-eight metric tons of weapons-grade plutonium – thirty-four metric tons on each side.

We continue to transfer quantities of surplus U.S. highly enriched uranium – more than thirty-four metric tons to date – to the U.S. Enrichment Corporation, for downblending to low-enriched uranium nuclear-reactor fuel. We recently signed an agreement with the TVA to dispose of another thirty-three metric tons of highly enriched uranium. This agreement with the TVA will save U.S. taxpayers nearly $600 million over the cost of disposing of it as waste.

Under the HEU Purchase Agreement with Russia, we have overseen the conversion of 110 metric tons of Russian weapons-grade HEU to low enriched uranium, for commercial sale to the U.S. for our nuclear power plants. This amount is equivalent to roughly 4,400 nuclear weapons.

NNSA employees are also training civilian nuclear reactor workers in Russia and the Newly Independent States to increase safety standards and prevent another accident, such as the one that occurred at Chornobyl. On December 15, 2000, the government of Ukraine permanently shut-down the last remaining operational reactor at the Chornobyl Nuclear Power Plant, on schedule. NNSA experts were instrumental in making certain this historic achievement was possible.

The Multi-spectral Thermal Imager satellite was launched on March 12th, 2000. This small research satellite was designed and built by a team of NNSA laboratories and industry partners, to develop and test remote sensing concepts that will add to our country's ability to monitor nuclear proliferation. Additionally, this unique satellite is being used by a wide number of civil, environmental, and defense scientists to conduct a broad array of government research.

The Nuclear Cities Initiative (NCI) aims to prevent and reverse the threat of proliferation of nuclear weapons expertise, by redirecting weapons scientists in Russia=s nuclear cities to sustainable, non-weapons activities. The NCI also enhances U.S. national security by assisting Russia in reducing the overall size of its nuclear weapons production complex. Last year, this program achieved an historic accomplishment when the Russians moved a concrete fence at the Avangard weapons facility, creating an open ATechnopark@ for commercial businesses. This is the first time that a Russian weapons facility has reduced its footprint, as part of the nuclear weapons complex downsizing they have committed to undertake.

All of this said, we face a period of uncertainty in our cooperative programs with Russia to reduce the threats of weapons of mass destruction. Recently, Russian President Putin dismissed the head of the Ministry of Atomic Energy, Minister Adamov, and replaced him with Alexandr Rumyantsev, from the Kurchatov Institute. We are uncertain what this change will mean for our programs. We remain concerned about access required to ensure that our cooperative threat reduction programs are implemented properly and that our financial contributions are well spent. We are also mindful of Russia=s cooperation with Iran.

Naval Reactors has compiled an unparalleled record of success, including

- Nuclear-powered warships have safely steamed more than 122 million miles, equivalent to nearly 5,000 trips around the Earth.
- Naval reactor plants have accumulated 5,200 reactor-years of operation, compared to approximately 2,540 for the U.S. commercial industry. In addition, our operating experience is approximately half that of the entire commercial power industry, worldwide (our 5,200 reactor-years, compared to approximately 9,660 worldwide, including the U.S.).
- Naval Reactors= outstanding, and fully public, environmental record enables our ships to visit more than 150 ports around the world, which is critical to our nation=s forward-presence strategy and ability to project power.

Policy Reviews

As mentioned above, the new Administration has chartered several reviews to create a new vision for the role of the nation=s military in the 21st century. These reviews will examine the appropriate national security strategy for this country. One of the reviews will encompass the role of nuclear deterrence and a position on the size of the future nuclear stockpile. A second review will evaluate all U.S. nonproliferation programs with Russia. At the end of this review, we may have a new strategy for our threat reduction activities with Russia. The Department and the NNSA are active participants in these reviews. The Administration will finalize FY 2002 and out-year funding requests for defense when these reviews are complete.

IMPROVEMENTS ARE STILL NEEDED

No matter the outcome of these strategic reviews, we recognize the need for change in the business practices of the Nation=s nuclear security enterprise.

While we are making steady progress, the NNSA still has work to do to get security right. Our people must see that there is value added in new or additional security requirements. We want to make sure that what we do actually improves security, and that security measures do not unnecessarily impede accomplishing our mission. We have stressed the concept of science AND security, rather than science OR security. We must make sure that the scientific culture and the security culture mesh. Our scientists must understand the need for classification and security, as they advance science. Similarly, our security officers must be sensitive to the environment in which we operate, and help further our mission. Our scientists, engineers, technicians, ***and*** our security and counterintelligence personnel must see themselves on the same team.

We must focus on revitalizing our infrastructure, which has long been neglected. This is key for the organization to improve morale, increase recruitment, and retain people. No one wants to work in a facility where weeds grow through the cracks in the buildings, or where you have to wear a hard hat, not for normal safety requirements, but because the concrete in the roof may fall down at any time. Revitalizing our infrastructure will take additional funding, but it will be incumbent upon us to set priorities so this job is done in the most cost-effective way, in future years.

NNSA, as an organization, must continue to sharpen its project management skills. Just two weeks ago I was at Lawrence Livermore National Laboratory=s National Ignition Facility. The people there are making great strides in focusing on the project, completing conventional-facility construction, and maintaining a schedule that will see this project to fruition.

At Los Alamos National Laboratory, Defense Programs must ensure that the capability to manufacture plutonium pits is reestablished, and we must come to grips with the long-term requirements for pit manufacture. We have recently established a full-time office in DP that focuses solely on pit production and certification. This pit project office sets schedules and milestones to ensure that we can produce pits, and that they can be certified by the laboratory for use in the stockpile.

A key to many of the management challenges facing the NNSA is implementing a planning, programming, budgeting, and evaluation process. This new management system will (1) improve discipline in program and project management, (2) ensure that each program and project receives appropriate consideration, as tradeoffs are made in establishing the integrated budget, and (3) create meaningful performance measurement and feedback systems. We will measure the value of this system through improvement in our mission performance.

As a first step in the implementation of this process, we have begun a strategic planning process to identify key goals of the NNSA, strategies for attaining those goals, and measures for tracking progress on our goals. In addition to ensuring that NNSA is in compliance with the Government Performance and Results Act (GPRA), this effort has helped foster a recognition of the benefits of managing nuclear security programs on an enterprise-wide basis. We have organized our budget testimony this year to track the key goals and strategies identified by our senior managers. Our six primary goals are

1. Maintain and enhance the safety, security, and reliability of the Nation=s nuclear weapons stockpile, meeting military requirements designed to counter threats of the 21st Century.
2. Assure the safe and secure management of nuclear facilities, materials, and expertise worldwide.
3. Detect, deter, and impede the proliferation and the use of weapons of mass destruction.
4. Provide the Navy with safe, militarily effective nuclear propulsion plants, and ensure their continued safe and reliable operation.
5. Ensure the vitality and readiness of the NNSA=s scientific and technical enterprise, for the next decade and beyond.
6. Create a well-managed, responsive and accountable organization by employing effective business practices.

GOAL 1: STOCKPILE STEWARDSHIP

We turn first to a discussion of the ***stockpile stewardship program that is designed to maintain and enhance the safety, security, and reliability of the nation=s nuclear weapons stockpile, meeting military requirements designed to counter threats of the 21st Century.*** To ensure that the U.S. stockpile of nuclear weapons remains safe, secure, and reliable, the NNSA will continue to advance the Stockpile Stewardship Program. This program was established by the Fiscal Year 1994 National Defense Authorization Act, which directed the Secretary of Energy Ato establish a stewardship program to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons.@ The Stockpile Stewardship Program must: (1) predict, detect, and evaluate potential problems, due to the aging of the stockpile, (2) refurbish and re-manufacture warheads and components, as required, (3) support focused, multi-faceted efforts to increase the understanding of the stockpile, and (4) maintain the science and engineering institutions needed to support the nations=s nuclear deterrent, now and in the future.

Surveillance and assessment activities, including many aboveground experiments, the manufacture of limited-life components and replacement parts, the reestablishment of a capability to fabricate plutonium pits, weapon refurbishments to extend the lifetimes of weapons in our aging stockpile, securing a source of tritium, and providing secure transportation of nuclear materials are all necessary, whether we=re conducting nuclear tests, or not. In addition, we must maintain our nuclear weapons complex, which has been downsized significantly during the last decade and is in dire need of

repair; ensure that we have a workforce with the necessary skills; and see to the safety and security of both our facilities and workforce, the communities in which we work, and the environment in which we live.

We are annually conducting hundreds of experiments at our national laboratories and the Nevada Test Site to increase our understanding of what happens when a nuclear weapon detonates. The software being validated by these experiments is already making significant contributions to the maintenance of the nuclear stockpile. Early versions of the three-dimensional weapon performance codes are resolving previously unexplained phenomena from past underground test data and are contributing to the resolution of issues that have been raised by our surveillance program. Simulations have also enabled us to qualify, for the first time without nuclear tests, a radiation-hardened component and a replacement neutron generator for the W76.

Experiments in facilities now under development, such as the National Ignition Facility (NIF), and those that are on-line, such as the Z accelerator and the Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT), will greatly expand our knowledge of what happens in a nuclear detonation. The closer our scientists and engineers get to duplicating in the laboratory the phenomena that occur in nuclear detonation, the greater our chances are of being able to continue to certify that our stockpile is safe, secure, and reliable, without the need to return to nuclear testing. But, even if there were no moratorium on nuclear testing, most activities encompassed by the Stockpile Stewardship Program would still be necessary to assess, certify, and maintain the safety, security, and reliability of the stockpile.

Stockpile Certification

A cornerstone of the Stockpile Stewardship Program is the certification to the President, by the Secretaries of Defense and Energy, whether any safety or reliability concerns exist that would require a return to nuclear testing. At his confirmation hearing, Secretary Abraham stated that, in his judgment, Aone of the most sobering and important responsibilities vested in the Secretary of Energy is the duty to certify to the President each year that the U.S. nuclear stockpile is safe, secure, and reliable....@ In a like manner, I believe my most important responsibility, as the Administrator of the NNSA, is to facilitate that process.

Certification is based on a yearly, rigorous technical review of the condition of the stockpile by the Directors of the three nuclear weapons laboratories, the Commander in Chief of the U.S. Strategic Command, and the Nuclear Weapons Council. The most recent assessment concludes that the stockpile is safe and reliable, and that no nuclear testing is needed at this time.

This certification is made possible by activities within the Stockpile Stewardship Program, through an extensive set of activities and tests assessing and qualifying the myriad of components and subsystems of each of our weapon system types. Data and test results must be analyzed, assessed, and

evaluated before conclusions can be drawn regarding the safety and reliability of stockpiled warheads. A significant imperative of assessment and certification is to develop the necessary tools to accurately baseline warheads in the existing stockpile, while designers with nuclear-test and warhead-design experience remain to mentor the next generation of stockpile stewards.

The key to accurate assessments is the expert judgment of our weapons scientists and engineers. Confidence in the accuracy of their judgment and confidence in the safety, security, and reliability of the warheads in our stockpile are more closely linked than ever before. In the past, a weapon steward=s judgment was developed and validated through new warhead design and nuclear testing. Today, our Stockpile Stewardship Program is honing and demonstrating expert judgment of the next generation of stockpile stewards through integrated use of surveillance, computational simulations, applied scientific experimentation, material and aging studies, and nonnuclear experiments.

In the absence of nuclear testing, a variety of experiments and tools provide data relevant to nuclear warhead performance. Some of the older tools, designed to complement nuclear testing, are not, in and of themselves, sufficient to provide the needed information. A suite of enhanced capabilities and facilities, to fill in the knowledge gaps and provide enhanced data relevant to various stockpile concerns, has been identified and is being developed through our Campaigns, described later in my testimony.

We are implementing stockpile stewardship through two strategies: a program of Directed Stockpile Work, and development of a suite of science, engineering, and readiness Campaigns.

Directed Stockpile Work

The first strategy for maintaining the safety, security, and reliability of the Nation=s nuclear stockpile is our program of Directed Stockpile Work, developed in concert with the DoD. This program applies the improved tools and technologies developed by all elements of the Stockpile Stewardship Program, and consists of three important elements: maintenance and evaluation, refurbishments, and dismantlements.

Stockpile Maintenance and Evaluation

The budget submission for FY 2002 will support all scheduled maintenance and evaluation activities for the current stockpile. Each year, eleven weapons of each type in the stockpile are returned from the active force and are disassembled, examined, tested, and analyzed for defects. One is destructively tested. If defects are found, their effect on reliability and safety is assessed. We conduct flight and laboratory tests on systems and components, including the destructive testing of pits. In FY 2002, we expect to conduct thirty flight tests, seventy-two laboratory tests, thousands of component tests, and we will destructively analyze nine pits. The current budget request will allow us to continue to reduce the backlog of laboratory tests resulting from other priorities during past years. The additional

$23 million over our request in FY 2001 that Congress provided for reducing the testing backlog was instrumental in reducing the backlog this year. The additional $17 million that Congress provided for the Enhanced Surveillance Campaign in FY 2001 enabled us to initiate and accelerate the deployment of advanced diagnostic tools, for early identification of warhead aging problems that otherwise may not be detectable until too late.

Scheduled maintenance also includes the replacement of limited-life components, such as neutron generators and tritium reservoirs. In FY 2002, we expect to produce and fill 1,695 tritium reservoirs, produce 1,445 new tritium reservoirs, re-certify 854 neutron generators, and produce 296 new neutron generators. In FY 2001, the complex accomplished the exchange of nearly 4,500 limited-life components. We also expect to achieve first production of replacement tritium reservoirs for the W62 and W87, and continue production of the replacement neutron generator for the W76.

As our nuclear weapons continue to age, we expect more parts to require replacement. Manufacturing replacement parts sounds straightforward, but in the time that has elapsed since the current weapons in the stockpile were originally manufactured, some of our production plants have closed, manufacturing processes, techniques, and standards have changed, and there are more stringent health, safety, and environmental standards. Under these conditions, manufacturing exact replacement parts is difficult, if not impossible and, because nuclear testing can no longer be used to qualify the replacements, extensive testing and analyses must be conducted to ensure that the replicated components are acceptable.

At present, we have nine weapons alterations underway to meet higher safety standards or to replace faulty components in various systems. We are currently on schedule with all nine alterations, and the FY 2002 budget supports those schedules. In addition, we have reached agreement, with the Department of Defense, on a comprehensive plan for refurbishing the nuclear stockpile over the coming decade. Implementation of that plan awaits the decisions from the Strategic Defense Review, and the current FY 2002 budget submission supports only limited execution of that plan.

Refurbishments

Following cessation of production at the Rocky Flats Plant in 1989, the U.S. has not produced a new nuclear warhead since 1991, nor have we had any requirement to build a new warhead. Prior to 1991, major refurbishment of a warhead to extend its life was not an issue, because new weapon types were continually being introduced into the stockpile. Currently, the average age of warheads in the stockpile is eighteen years, and signs of aging have been identified through stockpile evaluation and enhanced surveillance. As the stockpile ages, we are working closely with the DoD to finalize detailed plans to extend the lifetime of each warhead type. These life extensions, or refurbishments, include the detection and correction of problems, and provide and maintain safety improvements and use control.

The budget submission continues the major refurbishment of the W87 warhead, deployed on land-based intercontinental ballistic missiles. This is the first major retrofit of any warhead in nearly a decade. Delivery of the first production unit to the Air Force, in May 1999, as scheduled, six years after conception of the project, was a major success. The safety concerns and production-line problems that occurred at our Pantex Plant are lessons learned that will be applied in future refurbishments.

Last year, the Nuclear Weapons Council reached final agreement on the technical scope of the refurbishments needed for the B61 bomb and for the W76 and W80 warheads. Together, these systems comprise a substantial portion of the current U.S. stockpile, and the additional funding received for research and development in FY 2001 was used for W76 refurbishment design and W88 dynamic experimentation. The FY 2002 request will support laboratory activities to complete the ongoing studies to refurbish the B61 (some components of which are more than thirty years old), to initiate development engineering to support a first production unit in FY 2004, and to begin the development of a plan for certification of the B61, with a refurbished canned subassembly. We plan to work with the Department of Defense to determine a schedule and, possibly, revised scopes for the W76 and W80 refurbishments, pending completion of the Strategic Defense Review. The current budget request does not support the original schedule developed with DoD.

Warhead Dismantlement

Since the end of the Cold War, the United States has reduced its nuclear weapons inventory by approximately sixty percent. NNSA is currently disassembling two types of warheads, and is committed to the safe disassembly of any warheads retired, as a result of the ongoing national security strategy review or future decisions. Disassembly of the W79 Artillery-Fired Atomic Projectile will be complete in FY 2003, and disassembly of the W56 Minuteman II intercontinental ballistic missile warhead will be complete in FY 2005.

Campaigns

The second stockpile stewardship strategy is to maintain and develop the scientific, engineering, and manufacturing capabilities needed for the continued certification of the stockpile, including the ability to design new weapons and conduct underground nuclear tests. This strategy is being implemented through a series of Campaigns, which are focused, scientific and technical efforts to develop and maintain critical capabilities needed to enable continued certification of the stockpile for the long-term. They are technically challenging, multifunctional in nature, and have definitive milestones, specific work plans, and specific deliverables. The Campaign approach was initiated in FY 2001 as part of a new program planning and budgeting framework, to facilitate integration within the Stockpile Stewardship Program. There are currently seventeen campaigns:

- $ Primary Certification,
- $ Dynamic Materials Properties,
- $ Advanced Radiography,
- $ Secondary Certification and Nuclear Systems Margins,
- $ Enhanced Surety,
- $ Weapons System Engineering Certification,
- $ Nuclear Survivability (formerly Hostile Environments Certification),
- $ Enhanced Surveillance,
- $ Advanced Design and Production Technologies,
- $ Inertial Confinement Fusion and High Yield (includes NIF),
- $ Advanced Simulation and Computing (formerly the Accelerated Strategic Computing Initiative),
- $ Pit Manufacturing and Certification (formerly Pit Manufacturing Readiness),
- $ Secondary Readiness,
- $ High Explosives Manufacturing and Weapons Assembly/Disassembly,
- $ Nonnuclear Readiness,
- $ Materials Readiness, and
- $ Tritium Readiness.

Today, I would like to discuss, in detail, a few of these Campaigns.

Pit Manufacturing and Certification

We have not manufactured plutonium pits for use in the stockpile since 1989, when the Rocky Flats Plant stopped production of W88 pits, due to facility safety and environmental concerns. As a result, there are not enough W88 pits to meet future surveillance destructive- testing requirements. The budget request for FY 2002 continues to reestablish a capability to fabricate a limited number of plutonium pits at Los Alamos National Laboratory. The plan is to complete the fabrication of a certifiable W88 pit in FY 2003, within this budget request, with no commitment to a certification schedule or to production quantities. As we proceed, we will continue to work closely with the Navy to ensure that military needs for the W88 are met.

The additional $25 million, provided by Congress in FY 2001, was instrumental in developing momentum in pit manufacturing. The NNSA completed a report for Congress earlier this month, as requested by the conference report accompanying the Energy and Water Development Appropriations Act for FY 2001. The recently submitted report contains project schedules and cost estimates for production and certification of W88 pits.

The magnitude of the challenge to reestablish a pit production capability at Los Alamos National Laboratory can, perhaps, best be illustrated by the fact that approximately 18,000 activities and 350 individual work packages have been identified, to complete production and certification of the W88 with a newly manufactured pit. To date, we have produced eight W88 development pits, and are on

schedule to reestablish the technology and manufacture a certifiable W88 pit in FY 2003. A detailed and rigorous set of engineering and physics certification tests has been defined, to achieve certification without nuclear testing.

A pit project office was established this past year within Defense Programs, to provide oversight of all pit production and certification related activities. In addition to near-term activities, such as the W88, this new office is responsible for long-term pit production readiness planning. For future readiness, we are using the $2 million provided by Congress this fiscal year to conduct pre-conceptual design studies, sufficient to enable a decision for conceptual design planning of a modern pit facility in FY 2002. In FY 2004, new information from pit-aging studies is expected to provide further insight into pit lifetimes. This information, coupled with the requirements for the numbers and types of weapons in the stockpile resulting from the President=s Strategic Defense Review, will drive sizing decisions for a modern pit facility. The Nuclear Weapons Council will continue to monitor our work in this area.

Tritium Readiness

Every U.S. nuclear warhead requires tritium to function as designed. Because tritium, a radioactive isotope of hydrogen, decays at the rate of 5.5 percent per year, it must be periodically replenished within each nuclear warhead. We have not produced tritium since 1988, and our inventory, depending on the results of the Strategic Defense Review, is sufficient only until approximately 2005, after which time the five-year tritium reserve we maintain may begin to be drawn down. In May 1999, the Department announced that TVA commercial light water reactors would be used to produce tritium, and that accelerator production of tritium (APT) technology would be developed as backup, by completing preliminary design and engineering development and demonstration activities.

A 30-year interagency agreement with TVA went into effect on January 1, 2000, making three of its reactors, Watts Bar and Sequoyah 1 and 2, available to begin irradiation of tritium production absorber rods, as early as October 2003. This month, TVA submitted a request to the Nuclear Regulatory Commission (NRC) to amend its operating license for the Watts Bar and Sequoyah reactors, to permit irradiation of tritium producing absorber rods. The NRC committed to expediting the approval of these requests.

On July 27, 2000, ground was broken for the new Tritium Extraction Facility (TEF) at the Savannah River Site and, during FY 2001, site preparation and detailed design for the facility is expected to be completed. Originally, construction of TEF was to have begun in early FY 1999, but language in the National Defense Authorization Act for FY 1999 prohibited any tritium construction activities during FY 1999. Because of this delay in schedule, we project that the TEF will not begin delivering tritium gas from irradiated absorber rods until February 2006. Depending on the results of the Strategic Defense Review, about one year of the five-year tritium reserve may be consumed. The capacity of TEF to extract tritium from the absorber rods will be sufficient to restore the reserve, within two to three years.

Congress appropriated additional funding for APT in FY 2001, and the preliminary design of APT is expected to be completed this year. However, the current FY 2002 budget request does not include sufficient resources to complete the engineering development and demonstration activities in FY 2002, as previously planned. In addition, an Advanced Accelerator Applications Program that is being planned by Defense Programs and the Office of Nuclear Energy, Science and Technology, may be put on hold. This multi-mission accelerator program is to include waste transmutation, isotope production, and tritium production. An Accelerator Demonstration Test Facility is being planned that would have the capability to be upgraded to produce tritium, if required.

Advanced Simulation and Computing

Senator Bingaman indicated, in the preface to a question following Secretary Abraham=s confirmation hearing, that he was disturbed that, following the hearing held last Fall on the Stockpile Stewardship Program, as part of the hearings on the Comprehensive Test Ban Treaty, many of his Acolleagues seemed to get the impression...that the Stockpile Stewardship Program is a sort of computer simulation exercise...@ I want to dispel that impression.

Computer modeling and simulation are important elements of the Stockpile Stewardship Program, but the ultimate goal of our Advanced Simulation and Computing Campaign (ASC), formerly referred to as the Accelerated Strategic Computing Initiative (ASCI), is to have the ability to perform three-dimensional, high-fidelity simulations of the performance of all aspects of the operation of a nuclear warhead. By integrating the findings of our experimental and engineering R&D programs, as well as data from past nuclear tests, such simulations are providing our scientists with sufficient confidence to make it unnecessary to use underground nuclear testing at this time.

To fully achieve our goal, it is estimated that we must have a computer system operating at a minimum of 100 trillion operations per second (teraOPS), and computer software, validated by experimental data that provides a much greater understanding of the physics of nuclear explosions than we possess today. We are making remarkable progress toward achieving our goals in this area.

In December 1999, a three-dimensional simulation of the primary explosion of a nuclear warhead was successfully completed, for the first time, at Lawrence Livermore National Laboratory. This proof-of-principle simulation was performed on an ASC Campaign system operating at 3.89 teraOPS and took twenty days. On a Cray-class supercomputer, if sufficient memory were available, this simulation would have taken eighty years.

Soon thereafter, Sandia successfully completed the first-ever, three-dimensional computer simulations of a weapon warhead exposed to hostile radiation and blast environments. As part of this milestone, Sandia also completed a series of three-dimensional simulations of the performance of a

neutron generator in a radiation field. These weapon simulations collectively required about 500,000 megabytes of memory and used 2,000 computing processors for 45 days.

In April 2000, eight months ahead of schedule, a proof-of-principle, three-dimensional simulation of the secondary explosion of a nuclear warhead was completed at Los Alamos National Laboratory. This simulation was performed on two ASC Campaign systems, operating at approximately 3 teraOPS each, at Los Alamos and Sandia, and took 42 days. None of these simulations were possible, prior to the development of ASCI-scale computational platforms and software. We expect to meet the next milepost, a proof-of-principle three-dimensional simulation of a full weapon, including both primary and secondary operation, by the December 2001 scheduled date.

The ASC Campaign contributes to all elements of the nuclear weapons life cycle. It is providing the tools that are needed by weapons designers to maintain a nuclear weapon design capability. ASC Campaign computers are being used to help address issues associated with the manufacture of replacement parts for nuclear warheads, transportation and storage of weapons and components, certification of weapons, dismantlements, and the safety of weapons in various accident scenarios. The ASC Campaign is an integral and vital element of the Stockpile Stewardship Program. It provides the integrating simulation and modeling capabilities and technologies needed to combine new and old experimental data, past nuclear test data, and past design and engineering experience into a powerful tool for future design, assessment and certification of nuclear weapons and their components.

The success of the computer modeling and simulation program has been, in no small measure, due to the budgetary support it has received, since its inception. The computing speed, power, and level of physics detail existing today was simply undreamed of a few years ago. The current budget request, however, will slow the scheduled progress of the Campaign, and delay our previously announced commitment to reach a computing capability of 100 teraOPS from FY 2004 to FY 2005. This will delay, by at least a year, our major deliverable to Directed Stockpile Work **B** the ability to perform a high-fidelity simulation, in three-dimensions, of the performance of a full nuclear warhead.

Completion of three ASC Campaign construction projects will also be delayed for at least one year with this budget. These projects are the Distributed Information Systems Laboratory at Sandia National Laboratories in Livermore, the Joint Computational Engineering Laboratory at Sandia in Albuquerque, and the Terascale Simulation Facility at Lawrence Livermore National Laboratory. Two other ASC Campaign program elements will also be scaled back in FY 2002. These are the Path Forward program, which funds computer hardware and software companies to develop products needed to meet the aggressive ASC Campaign schedule, and the DisCom^2 program, which provides remote access to the large computing platforms, enabling sharing of these resources among our production plants and laboratories.

These deferrals in meeting ASC Campaign milestones are consistent with the possible refurbishment schedules that achievable with the FY 2002 Budget request.

Our commitments to selected groups in the university community through our Academic Strategic Alliances Program will not be affected, nor will the operation of the 12-teraOPS machine at Lawrence Livermore National Laboratory, which was recently made available for software development and warhead simulations. It is already fully utilized.

Inertial Confinement Fusion and the National Ignition Facility

The National Ignition Facility, under construction at the Lawrence Livermore National Laboratory, is a vital element of the Stockpile Stewardship Program. It will allow us to study issues that affect aging and refurbishment of the stockpile, validate advanced simulation software being developed by the ASC Campaign, and help in attracting and retaining the exceptional scientific and engineering talent needed by the Stockpile Stewardship Program, over the long term.

The National Defense Authorization Act for FY 2001 required the submission of a revised project baseline for NIF, in response to substantial cost increases and schedule slippage, caused by **problems in assembling and installing the laser and target system infrastructure**. The revised baseline, submitted in final form to Congress last September, retains the full NIF design capability of 192 beams, with completion of the project scheduled in FY 2008, and experiments with the first eight laser beams beginning in FY 2004. It is important to understand that we will be conducting many experiments at NIF, well before all 192 beams are available in FY 2008. Between FY 2004 and FY 2008, approximately 1,500 experiments will be conducted at NIF. The project goals are to achieve early light in 2003, with four laser beams, and to meet our AFirst Light@ milestone, with eight laser beams, in 2004.

I believe the progress at NIF reflects several management decisions that have been made during the past year and half. These include (1) the hiring of an industrial contractor with a proven record of constructing similarly complex facilities, to manage and install the laser and target system, (2) the creation of a NIF Project Office that reports directly to the Deputy Administrator for Defense Programs, (3) the appointment by the laboratory director of an associate director with line responsibility for the NIF Project, and (4) the selection of a new project manager, with extensive project management experience, to oversee daily NIF Project activities.

As required by the FY 2001 Energy and Water Development Appropriations Act, I recently certified to Congress that the NIF Project milestones, for the revised schedule, are being met within the revised budget. The project is making significant progress. We expect to complete construction of conventional facilities this fiscal year. Laser bays are now under clean room protocols, and installation of laser systems has begun. Our glass manufacturers have delivered more than 1,700 of the required 3,500 laser glass slabs that meet our specifications.

The Conference Report accompanying the Energy and Water Development Appropriations Act for FY 2001 also directed the NNSA to assess the role of NIF, to consider the requirement for the full 192-beam configuration, and determine if alternatives to the full NIF could meet the safety and reliability needs of the nuclear weapon stockpile. To meet this requirement, the NNSA initiated a broader study to examine its entire High-Energy-Density Physics Program. NNSA brought together laboratory leadership and technical staff, DP management, and a number of nuclear-weapon-knowledgeable advisors from a variety of federal organizations. Alternatives that were considered included pauses in NIF construction at 48, 96, and 120 beams, a refurbishment of the Z accelerator at Sandia, and the addition of an engineering demonstration milestone to the NIF Project at first light. The principal recommendation of this study, which was submitted to Congress on April 6, was that the NNSA should continue with the current High-Energy-Density Physics Program, including Omega, the Z accelerator, and the 192-beam NIF, with the goal of achieving ignition.

Experiments on the Atlas pulsed-power machine at Los Alamos National Laboratory will begin later this year and will continue in FY 2002. Relocation of the facility to the Nevada Test Site will be deferred, due to higher priorities of the stockpile and limitations imposed by the current FY 2002 budget. In FY 2001, we also expect the completion of the Z-backlighter project at Sandia, in which the Beamlet, a technology demonstration for NIF, is being adapted as a diagnostic tool for use on the Z accelerator. A variety of experiments with this technology, planned to begin in FY 2002 to study hydrodynamics, materials properties, and inertial confinement physics, may also be deferred.

Other Campaign-Specific Experimental Activities

Other experimental activities are underway, across the complex, in support of the nation=s nuclear deterrent. At Los Alamos National Laboratory, physics experiments using the first-axis of the Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) have been conducted, providing valuable weapons data. DARHT provides us the capability to take freeze-frame photos of materials imploding at speeds greater than 10,000 miles an hour, allowing scientists to study solids and metals as they flow like liquids, when driven by the detonation of high explosives. We expect the second arm of DARHT to be completed in FY 2002, allowing simultaneous views from two directions, as well as several separate views over the time of the implosion.

Subcritical experiments at the Nevada Test Site continue to be successful. To date, thirteen have been conducted. These experiments are helping us to assess the stockpile by providing understanding of aspects of weapons physics and the aging properties of plutonium. They also help us to certify pits manufactured at Los Alamos National Laboratory, for use in the nuclear weapons stockpile. In addition, subcritical activities are a major contributor to underground nuclear test readiness at the Nevada Test Site. To support related materials research, we have also begun acceptance tests on the JASPER (Joint Actinide Shock Physics Experimental Research) gas gun at the Nevada Test Site. We expect to begin obtaining data on plutonium late this year.

During this next year, we will look hard again at improving test readiness, and will review whether an apporpriate level of resources is being applied to this vital element of stockpile stewardship.

GOAL 2: SECURING NUCLEAR FACILITIES, MATERIALS, INFORMATION, AND EXPERTISE WORLDWIDE

Our second goal is to ensure the safe and secure management of nuclear facilities, materials, and expertise, worldwide. While maintaining and enhancing the safety, security, and reliability of the Nation=s nuclear weapons stockpile, the NNSA has a custodial responsibility to ensure that all U.S. nuclear-deterrent assets **B** information, facilities, and people **B** are safeguarded and secured to prohibit unwanted damage or unauthorized release of these key U.S. national security assets. The NNSA also works in parallel to address international threats to U.S. national security interests from the potential proliferation of weapons of mass destruction. These new international threats derive largely from the Soviet Union=s production of enormous quantities of nuclear materials and weapons, and from potential actions by rogue nations or terrorist organizations with interests contrary to those of our nation. The NNSA is pursuing a balanced and comprehensive approach to nonproliferation that seeks to reduce or eliminate these threats to U.S. national security interests, particularly threats in Russia and countries of the former Soviet Union.

Integrated Security Action Plan

A key strategy for preventing proliferation is effectively managing and protecting the NNSA nuclear weapons, materials, and information. The NNSA is pursuing an Integrated Security Action Plan to protect U.S. nuclear assets. While we are making steady progress, NNSA still has work to do to get security right. We have commissioned a group of eminent Americans, known as the Hamre Commission, to review the entire issue of science and security to help us make sure we get the right picture and perspective. I have warned them to be careful with their recommendations, because many of them are likely to be implemented.

I have called for a six-month moratorium on implementing any ***new*** safeguards and security policies. We are using this time to review past policies, identify policy improvements, and determine how policy can most effectively be implemented within NNSA. We are emphasizing the importance of personal commitment and individual responsibility in the protection of our nation=s vital assets, and we are seeking to involve employees at all levels of our enterprise in improving safeguards and security.

The NNSA is ***ensuring that people working on our nuclear deterrent are aware and accountable for their national security responsibilities.*** In that regard, on March 26, 2001, I announced plans for implementing AIntegrated Safeguards and Security Management@ in the NNSA. ISSM, as it is known, will build safeguards and security considerations into management and work practices, at all levels, so that missions are accomplished securely. Individuals performing the work will be involved in the process of establishing appropriate safeguards and security practices. Subject matter experts are available to provide guidance and information, but we must place the responsibility for working securely squarely on the shoulders of every individual in our complex – the scientists, technicians, production workers, and professionals performing and managing our missions.

As you know, the counterintelligence polygraph program has raised concerns among scientists and others within the NNSA community. We are sponsoring a scientific study by the National Academy of Sciences (NAS) on the validity and reliability of polygraphy. The NAS study will include what is known about the effects of medications, sleep deprivation, and illness on the physiological responses measured through polygraph examinations. The fifteen-month study began on January 1, 2001. The study=s final report is to be released next year and should help us improve upon the Department of Energy=s polygraph program.

Safeguards and Security

The NNSA is ***protecting U.S. nuclear facilities***. The NNSA conducts a rigorous Safeguards and Security program to protect the physical assets of the NNSA enterprise. These efforts are an integral part of the Administration=s mission of being a responsible steward of the nation=s nuclear weapons. In FY 2001, safeguards and security activities were appropriated as direct costs, rather than as allocated costs within indirect and overhead funding, as in the past. We are managing the safeguards and security as a line responsibility in the NNSA. My Chief of Defense Nuclear Security is responsible for establishing safeguards and security policy throughout the NNSA. We will administer the weapons safeguards and security budget for facilities where NNSA is the landlord, through our new Facilities and Operations organization, which I will discuss later in this testimony.

In 1999, a multitude of corrective actions and enhancements to upgrade the safeguards and security posture at all Defense Programs sites resulted from a program named “Safeguards and Security Goal Posts.” By the beginning of FY 2001, all final corrective actions and enhancements resulting from this program had been completed for all sites, except the Y-12 Plant, which was the only site not rated “satisfactory.” The ability of the Y-12 Plant to attain an overall satisfactory rating hinges on the availability of funds to correct deficiencies in material control and accountability for the highly enriched uranium operations. The FY 2002 Budget request will maintain physical security functions at our production plants, the Nevada Test Site, and the national security laboratories, at their current security ratings.

The NNSA is ***protecting vital nuclear deterrent information***. The Integrated Safeguards and Security Management program is designed to systematically integrate safeguards and security into management and work practices, at all levels, so that missions are accomplished securely. Implementation of the AHigher Fences@ initiative, to enhance protection of certain restricted weapons data within DOE and DoD, by establishing an additional sigma category, requires few resources and is moving forward.

The nuclear weapons complex has always used secure computing systems and networks. However, the need for significant improvement in the protection of nuclear weapon data across the entire complex has been well documented in the past two years. An increased number of countries and organizations are attempting to obtain nuclear weapon data and are using ever increasing sophisticated techniques.

In response, Congress provided supplemental funding in FY 2000, to begin developing the Integrated Cyber Security Initiative (ICSI) Plan. Implementing this plan will sustain the operations and maintenance of cyber security activities throughout the complex, providing solutions for the most critical vulnerabilities revealed through risk assessments of the current network. Also, as called for in the ICSI plan, we will implement and demonstrate a testing network for evaluating and testing products and proposed solutions, complete the design of a new complex-wide network, and identify and catalog all electronic information that is exchanged in the complex.

The FY 2002 Budget request will move us forward on the Integrated Safeguards and Security Management program and the AHigher Fences@ initiative, and will allow us to sustain the maintenance and operation of cyber security activities across the complex, and to provide upgrades where the highest vulnerabilities are assessed, but will not allow us to address the long-term solutions set forth in the Integrated Cyber Security Initiative (ICSI) Plan that was submitted to Congress in March of this year.

Transportation Safeguards System

The NNSA is ***protecting the U.S. movement of nuclear materials, components and nuclear weapons***. The NNSA operates a Transportation Safeguards System to move nuclear weapons, components, and special nuclear materials, throughout the country, in a safe and secure manner, precluding theft or diversion. This unique transportation system has operated with an impeccable record of safety and security for more than twenty-five years. Although its primary mission has been in support of the nuclear weapons program, the system provides transportation services for all DOE programs that require nuclear materials to be protected while in transit. This summer, the Office of Environmental Management will begin to remove nuclear materials from Rocky Flats. Other programs have also projected increases in their requirements for secure shipment of nuclear materials. The Transportation Safeguards System resources will have to be increased during the next five years to meet the projected demand for secure shipment of nuclear materials. Headquarters and the

Albuquerque Operations Office, in collaboration with other program offices, have initiated a coordinated planning and scheduling process to improve the optimum usage of our assets, to establish NNSA authority to certify Type B shipping packages, and to expand our capabilities by hiring and training special federal agents and enlarging the fleet of trailers, tractors, and escort vehicles.

Defense Nuclear Nonproliferation Activities

With respect to NNSA=s international nuclear security responsibilities, the NNSA develops and implements critical U.S. nonproliferation programs. Its role is due, in large measure, to the unique expertise in nuclear weapons and nuclear material handling that it draws from the national laboratories. The NNSA=s goal is to ensure the close integration of technical talent and policy expertise with the efforts of other U.S. agencies working in the nonproliferation arena. Our goal is to address this complex, multifaceted issue in a comprehensive way, with specific, realistic goals for each part of the program. The Office of Defense Nuclear Nonproliferation=s programs address different types of problems, and they are designed to do different things, while working to achieve the overall goal of reducing the threat of proliferation of weapons of mass destruction. All of these programs, together, offer a synergy of effect that is greater than the sum of the parts.

The NNSA is ***pursuing strategies to protect or eliminate vulnerable weapons-usable nuclear material or infrastructure, and redirect excess weapons expertise to civilian enterprises in Russia and other nations that possess vulnerable materials.*** The Office of Defense Nuclear Nonproliferation is responsible for these nuclear security programs, along with other programs that seek to prevent, detect, and deter proliferation of weapons of mass destruction and the materials needed to produce them. Key programs within NN that deal with vulnerable weapons materials and the nuclear complex infrastructure in Russia include (1) Materials Protection, Control, and Accounting; (2) Fissile Materials Disposition; (3) HEU Transparency Implementation; (4) the Nuclear Cities Initiative; and (5) Initiatives for Proliferation Prevention. NN=s other nonproliferation and arms control programs will be discussed in the next section. The three-fold threat of unsecured materials, widely available technology, and underemployed expertise following the breakup of the Soviet Union makes these issues of paramount importance and urgency.

Materials Protection, Control, and Accounting

The NNSA conducts effective programs in Russia to ***protect vulnerable weapons and weapons-usable nuclear materials.*** The NNSA=s Materials Protection, Control, and Accounting program (MPC&A) is working rapidly to complete its mission, and estimates in its Strategic Plan that comprehensive security upgrades will be complete at all of the warhead storage locations that the Russian Navy has requested, as early as 2007, and for 603 metric tons of weapons-usable nuclear material by 2011. Since 1993, the program has completed rapid upgrades for nearly 4,000 warheads and 220 metric tons of fissile material. The unprecedented degree of cooperation and access shown by the Russian Navy to NNSA employees has facilitated the advancement of our work at a number of very

sensitive Russian sites, allowing us to focus our personnel and funds on promptly securing the items in Russia that are most attractive to diversion. One programmatic goal for FY 2002 is to complete security upgrades at thirteen nuclear sites, bringing the total number of completed sites to fifty.

Another goal is to promote sustainable security improvements. "Sustainability" is critical to the long-term mission of the program, because we must ensure that installed MPC&A systems are maintained and operated over the long term. Sustainability also entails fostering the ability of our Russian counterparts to operate and maintain the MPC&A systems unilaterally. To ensure sustainability, we are establishing training centers, identifying credible Russian suppliers of MPC&A equipment, helping draft national regulations and security force procedures, and establishing a federal information accounting system to track amounts and locations for all of Russia's nuclear material. Specifically, in FY 2002, we will conduct fifty training courses in MPC&A design, operation, and maintenance for more than 2,400 students, bringing the total number of Russian personnel trained in MPC&A concepts to greater than 6,000. Furthermore, we have developed and implemented a program to consolidate material into fewer buildings and fewer sites, and to convert excess highly attractive material to a form that is less attractive to potential proliferant nations. In FY 2002, this program will convert an additional 1.8 metric tons of highly enriched uranium to low-enriched uranium (LEU), raising the total converted to four metric tons. This program reduces costs to the U.S. by limiting the number of buildings requiring security upgrades. It also reduces the Russia-borne costs of maintaining installed security upgrades once NNSA=s funds are no longer provided.

The NNSA conducts two separate, yet complementary, programs to ***eliminate vulnerable weapons and weapons-usable nuclear materials in Russia***, so that it will never again be used for weapons purposes. We estimate that there are roughly 150 metric tons of plutonium and more than 1,000 metric tons of highly enriched uranium in Russia. These programs are the first step in what is sure to be a lengthy process.

Fissile Materials Disposition

The Fissile Materials Disposition program is responsible for disposing of inventories of surplus U.S. weapon-grade plutonium and highly enriched uranium, for reducing the significant costs associated with long-term storage of these materials in the U.S., as well as for providing the technical support for, and ultimate implementation of, efforts to obtain reciprocal disposition of surplus Russian weapon-grade plutonium. This disposition program is among the nonproliferation programs that is currently undergoing a National Security Council review of U.S.-Government nonproliferation assistance programs to Russia.

The FY 2002 Budget request will fund the completion of the mixed oxide (MOX) Fuel Fabrication Facility design and proceed with related MOX fuel qualification activities. We will continue the design of the Pit Disassembly and Conversion Facility at a reduced rate, and we will suspend the design of the Plutonium Immobilization Plant. These changes are necessary, to reduce the anticipated

future-year peak funding requirements associated with plans for simultaneously building three plutonium disposition facilities at the Savannah River Site. Despite these schedule changes, the NNSA continues to pursue the irradiation of MOX fuel in existing reactors and immobilization for the disposition of surplus U.S. weapon-grade plutonium. This will enable us to meet the commitments called for in the recently signed U.S.-Russia Plutonium Management and Disposition Agreement and to support the continued consolidation, cleanup, and shut down of DOE sites where surplus plutonium is stored.

Other activities planned for FY 2002 involve providing limited support for the development of facilities in Russia for disposition of surplus plutonium, and continuing surplus U.S. HEU disposition, including capital improvements at the Savannah River Site to support the off-specification blend-down project with the TVA. This project will eliminate tons of surplus weapons material, by converting it to reactor fuel for use in TVA's reactors, which provide electric power throughout the Southeast. Equally important, this work will also save the taxpayers $600 million by avoiding the cost to dispose of this surplus material as waste.

HEU Transparency Implementation

The NNSA is working to convert Russian surplus HEU from the Russian military stockpile into a non-weapon-usable form. The 1993 U.S.-Russia HEU Purchase Agreement remains one of the more impressive nonproliferation achievements of the last decade. The NNSA=s HEU Transparency Implementation program is designed to provide assurance that surplus HEU, from dismantled Russian nuclear weapons, is downblended in Russia to LEU and fabricated into fuel for sale and use in U.S. commercial power reactors.

The program monitors the conversion and processing of this material at Russian facilities, subject to the terms of the Agreement. Over the course of the program thus far, seventy-three teams **B** the equivalent of more than 4,000 monitoring hours **B** have visited these facilities to monitor conversion operations. During the past year, the NNSA installed a Blend-Down Monitoring System (BDMS) at one Russian facility, to provide continuous monitoring data in support of our transparency objectives. The FY 2002 Budget request will allow the NNSA to continue its blend-down monitoring activities, but at a slightly reduced level. Through the end of 2000, more than 111 metric tons of weapons grade uranium **B** enough for roughly 4,400 weapons **B** had been removed from the Russian military program, under this Agreement, and converted to LEU for commercial sale. Our goal for 2001 is to convert another thirty metric tons. This program is a major source of income for the Russian government. Approximately $2.2 billion has been paid to the Russian Federation under this Agreement, and some of this money is to be used for the conversion of defense enterprises and for enhancing the safety of Russian nuclear facilities.

Redirecting Excess Weapons Expertise and Eliminating Weapons Infrastructure

The NNSA conducts two programs focused on ***redirecting excess weapons expertise in Russia to civilian enterprises and eliminating their weapons infrastructure***. The Nuclear Cities Initiative and the Initiatives for Proliferation Prevention Program are programs that work together with the International Science and Technology Centers and the Civilian Research and Development Foundation to address all aspects of this issue.

Nuclear Cities Initiative

NNSA=s unique Abrain drain@ program, the Nuclear Cities Initiative (NCI), was created in 1998, to assist the Russian Federation in (1) diversification of the economy within the closed nuclear cities to attract commercial investors, (2) enhancement of U.S. national security by assisting Russia in reducing the overall size of its nuclear weapons production complex, and (3) prevention and reversal of the threat of proliferation of nuclear weapons expertise, by redirecting weapons scientists in Russia=s nuclear cities to sustainable non-weapons activities. We are striving to accomplish this task, working closely with the Russians, to (1) facilitate transition from weapons research to civilian business and commercial projects, (2) develop joint plans for accelerated downsizing of the Russian nuclear complex, (3) develop local infrastructure to support economic diversification and job creation, (4) conduct targeted training and other activities to improve marketing and management capabilities, and (5) leverage funding and encourage non-U.S. Government investment.

The FY 2002 Budget request will allow the NNSA to focus its commitments in only Sarov, Russia. In an effort to make the closed nuclear cities in Russia more amenable to international businesses, the NNSA has facilitated the creation of two International Business Development Centers, two Open Computing Centers, and two Nonproliferation Centers for research and training new nonproliferation experts. Additionally, we have expanded and upgraded telecommunications capabilities, to enable remote work to be done from those geographically isolated cities. Thus far, with a limited budget, NNSA has facilitated initiation of more than twenty-five commercial and infrastructure projects in the cities, with more than $8 million spent in Russia. With our help, loan officers of the European Bank for Reconstruction and Development loan officers are now established in each city, making more than $1 million in small-business loans to local non-weapons businesses in the closed cities. We are pleased that there are now twenty-four business training courses in those three cities, with hundreds of participants. Looking to the future, we are hopeful that negotiations involving more than ten potential commercial investors will soon bear fruit.

Initiatives for Proliferation Prevention

The Initiatives for Proliferation Prevention (IPP) program was established in 1993, to prevent the proliferation of weapons technologies and expertise, by engaging former Soviet weapon scientists in cooperative research projects with DOE national laboratories and U.S. industry partners, especially in

areas that have a strong potential for non-military commercialization. This program enhances U.S. national security by engaging former Soviet weapons scientists in civilian work, to prevent the spread of technologies related to weapons of mass destruction and also to increase access to, and transparency at, former Soviet weapons facilities. We have developed a rigorous process of screening all projects for potential dual-use activities or efforts, relying on other parts of the U.S. Government to bring their expertise to bear on this issue. At the same time, NNSA=s activities in this arena also provide U.S. industry with technology and research talent from the former Soviet military establishment. Since its inception, the IPP program has engaged more than 8,000 scientists, engineers, and technicians in the Newly Independent States, and is supporting sixty-four cooperative research projects at sixty- five institutes. These efforts realized seven commercial projects and generated $9.4 million of commercialized products.

International Nuclear Safety and Cooperation

Another strategy for enhancing nuclear security is to improve operational safety and safety systems at nuclear facilities of concern. The NNSA is working to reduce safety risks at the sixty-six operating, Soviet-designed nuclear-power reactors in nine countries, through the International Nuclear Safety and Cooperation program. We plan to complete safety upgrades for these reactors by 2006. There are three reactors in Russia that are to be shut down, as part of DoD=s program to eliminate the production of weapons-grade plutonium. These three high-risk reactors, at secured sites, are the oldest operating reactors in Russia, and have not received any safety upgrades under foreign cooperation. Safety upgrades at these production reactors, prior to their planned shutdown in 2006, are among our highest priorities. However, the scope of activities for improved safe operation will be limited.

We are encouraged not just by our progress to address nuclear safety at operating reactors, but by the early closure of older reactors as well. The Ukrainian government shutdown Chornobyl's sole operational reactor **B** Unit 3 **B** in December 2000, as planned. Our efforts to support the construction of a replacement heat plant at Chornobyl, for decontamination and decommissioning purposes, are also proceeding well. We were pleased when Kazakhstan also made the tough decision to shut down its BN-350 reactor. Our attention is now focused on plans for decommissioning and decontaminating the reactor's sodium coolant, which will ensure that this reactor can never be restarted. The FY 2002 Budget request will allow us to complete one full-scope, nuclear plant training simulator, each, in Russia, Ukraine, and Slovakia. We will also strive for the completion of operational safety improvements at all plants in Russia and Ukraine. Safety procedure and reactor in-depth safety assessments will proceed, albeit at a delayed pace.

GOAL 3: DETECTING, DETERRING, AND IMPEDING PROLIFERATION

Our third goal is to detect, deter, and impede proliferation and the use of weapons of mass destruction. As mentioned in the previous section dealing with nuclear material security, the

NNSA develops and implements critical U.S. nonproliferation programs. In addition to the programs already described, NN has extensive efforts in research and development (R&D) and arms control arenas. Our active role in the U.S. nonproliferation interagency community derives, in large measure, from the nuclear expertise found in the national laboratories. NN supports U.S. national, bilateral, and multilateral efforts to reduce the threat posed by the proliferation of weapons of mass destruction.

Research and Development Programs

A key nonproliferation strategy is to enhance the capability to detect weapons of mass destruction. The NNSA goal of integrating technical talent and policy expertise is evident in the Nonproliferation and Verification R&D Program, which enhances U.S. national security through needs-driven R&D, with an emphasis on developing technologies to detect nuclear, chemical, and biological proliferation, and to monitor nuclear explosions.

The following accomplishment is just one indication of the type of activities NNSA is involved with in the R&D area. NNSA was proud that, last year, we achieved a significant milestone in one of our R&D programs: The Multispectral Thermal Imager satellite was launched in March 2000. This small research satellite, designed and built by a team of NNSA laboratories and industry partners, will develop and test remote-sensing concepts that will add to our country's ability to monitor nuclear proliferation. Originally designed for a 14-month research mission (with an expectation of three years of useful operation), the satellite has already achieved most of its design objectives. The MTI program has developed the sensor technology and data processing methodology to make extremely precise multispectral remote sensing measurements from space, and to use these measurements to extract important proliferation monitoring information about observed sites. The engineering required to achieve these precise measurements and complex algorithms, to extract the useful information, is being validated through experiments with the satellite. Additionally, the satellite has been used to support numerous civil, environmental, defense, and space science researchers throughout the government. The satellite has collected more than a thousand images and approximately one third of these were at the request of non-DOE experimenters.

The ***Proliferation Detection*** program will develop the requisite technologies to detect nuclear proliferation. Our unchallenged lead responsibility for nuclear nonproliferation technology derives from the expertise and knowledge base resident in our nuclear weapons complex, and it provides a technology template for the detection of activities related to all weapons of mass destruction. The objectives of the detection program are

- to produce technologies that lead to prototype demonstrations and resultant remote proliferation detection systems,
- to strengthen our detection capabilities to respond to current and projected threats to national security and world peace posed by the proliferation of nuclear, chemical, and biological weapons, and

- to develop technologies that are subsequently made available to a wide range of government users, including DoD and the intelligence community.

The separate, yet closely related, ***Proliferation Deterrence*** program seeks to develop technical options to prevent and deter proliferation of nuclear weapon technology and fissile materials. Research is focused on developing integrated sensor systems that will improve the accuracy and timeliness of information. Our NNSA experts are working hard to build robust technical deterrence capabilities that include the development of unattended and handheld technologies designed to shape U.S. diplomatic efforts that rely upon verification or confidence building measures, in addition to the development of technical means to defend the homeland against lost or stolen, foreign weapons or fissile materials. We are also improving our forensic capability to identify the origin of fissile material that might be associated with a nuclear threat.

With the FY 2002 Budget, we will continue to develop and demonstrate innovative remote sensing, sampling, and analysis technologies needed to improve early detection of a proliferant nation=s nuclear weapons program or non-compliance with international treaties and agreements, as well as tracking foreign special nuclear materials.

The ***Nuclear Explosion Monitoring Program*** is designed to provide the U.S. with the technical capability to detect nuclear explosions. Specifically, NNSA technical experts are working to develop and deploy sensors and algorithms that enable the U.S. to meet its national requirements for detecting, locating, identifying, and characterizing nuclear explosions in the atmosphere, in space, underground, or underwater. Additionally, we are transitioning technologies to, and providing operational support for, U.S. national nuclear explosion monitoring agencies, including the Air Force Technical Applications Center, in partnership with other Air Force elements, the United States Geological Survey, and other government agencies. The program seeks to

- **$** enable detection of very low-yield events, especially those that might arise from proliferant nation efforts,
- **$** deliver ground-based systems comprising state-of-the-art hardware and software products for seismic, hydro-acoustic, infrasound, and radionuclide technologies, and
- **$** develop, engineer, and deliver satellite-based systems to the Air Force. During the next five years, we will develop, demonstrate, and begin deliveries of a new generation of optical, electromagnetic pulse, and direct-radiation sensors for Global Positioning System Block II-F satellites.

In FY 2002, the Nuclear Explosion Monitoring program will continue to develop enabling technology, operational hardware and software, and expertise to detect, locate, identify, characterize, and attribute nuclear detonations through both ground-based and satellite-based systems.

To meet threats posed by chemical and biological agents, the NNSA draws upon the diverse and extensive expertise of its national laboratories. The goal of the ***Chemical and Biological National Security Program*** is to develop, demonstrate, and deliver technologies and systems that will lead to major improvements in U.S. capability to prepare for, and respond to, chemical or biological attacks against civilian populations. This program will continue to focus emerging science and technology on the threat of chemical and biological attack against U.S. civilian populations. The NNSA is the primary agency developing non-medical technical solutions for this challenge. Our experts are involved in a broad interagency program to develop sensors that could detect the terrorist use of a biological agent at a large outdoor event, such as the Super Bowl or the Olympics. While we do not have the lead on this activity, NNSA brings to the table superb technical experience in this field. The NNSA is providing the underpinning biological information necessary for biological detection that would support analyses for attribution and event reconstruction purposes, and would aid other agencies in the development of medical and public health countermeasures. The goals of this program are to develop and demonstrate

- chemical and biological detection, identification, and warning systems for domestic, high-risk areas or conditions,
- hand-portable chemical and biological detectors, to provide real-time detection to increase situational awareness during crises, and
- modeling and simulation capabilities, to enable accurate prediction of the effects from chemical and biological attacks in urban areas, to guide preparation and response efforts, chemical and biological decontamination, and restoration techniques for use in civilian settings.

The construction of the Nonproliferation and International Security Center at Los Alamos will continue with funding of $36 million in FY 2002, allowing for its completion in this same fiscal year.

Arms Control and Nonproliferation

Another key strategy is promoting arms control and nonproliferation treaties, promoting agreements, and regimes, and developing the associated technologies to support them. The mission of the Office of Arms Control and Nonproliferation is to detect, prevent, and reverse the proliferation of weapons of mass destruction (WMD) materials, technology, and expertise. It is the focal point within the NNSA for activities that support the President=s nonproliferation and international security policies, goals, and objectives, as well as those activities mandated by statute. The program provides policy and technical expertise and leadership for NNSA and the Department in interagency, bilateral, and multilateral fora involved in nonproliferation and international security matters. Several projects that had been initiated last year are not proceeding currently. The NNSA will not be proceeding with the Separated Civil Plutonium activities, due to Russian nuclear cooperation with Iran. Funding for Spent Fuel Storage and Geological Repository in Russia are on hold, to allow time for the new Administration=s interagency policy review. At the current budget level for FY 2002, further

assistance to Kazakhstan, in implementing the secure long-term storage of the BN-350 plutonium-rich fuel, will be curtailed.

Russia-Focused Programs

The Second Line of Defense program was created in 1998. It is designed to help the Russians detect and prevent nuclear proliferation or terrorism through the installation of radiation detection equipment at strategic transit and border sites in Russia. It also helps to strengthen Russia=s ability to detect and deter illegal nuclear transfers, thus adhering to its international nonproliferation commitments. In FY 2002, this program will be expanded slightly, to increase our cooperation with the Russian Customs Committee. This program=s objectives include

- equipping vulnerable border and transit sites with radiation detection equipment,
- utilizing a Asystems@ approach to equipment installation, including rigorous vulnerability assessments, site survey, and design of candidate sites, and acceptance testing and data evaluation of installed equipment, and
- ensuring sustainability through training for equipment use and procedures for response, using Russian-manufactured and U.S.-tested detection equipment, and providing mobile training stations for use in remote regions.

To date, this program has been quite successful on a limited budget of several million dollars per year. Equipment has been installed at the airports in Moscow and St. Petersburg, and at a port on the Caspian Sea. Eight sites are fully equipped and installation at three additional sites is underway. This relatively young program already has reached significant achievements, including ninety customs officers trained, training manuals distributed to 30,000 front-line officers, passive searches of roughly 120,000 vehicles, 11,000 railroad cars, and greater than 750,000 pedestrians, using radiation detectors installed under our joint program.

Policy and Analysis

The Policy and Analysis office provides analytical support and technical expertise for arms control and nonproliferation treaty, and for agreement policy formulation, negotiation, and implementation at DOE and NNSA facilities and for regional security initiatives. In the next fiscal year, the NNSA will continue to promote arms control and nonproliferation activities, both under formal treaty-related mechanisms and under less formal mechanisms, including the Warhead Safety and Security Exchange (WSSX) Agreement, negotiations on Russian plutonium oxide measurements, under the Plutonium Production Reactor Agreement, and testing, evaluating, and demonstrating technologies, in accordance with the Joint DOE-DoD Integrated Technology Plan. These technologies would support transparency negotiations for several initiatives, including the monitoring regime, to be implemented at the Fissile Material Storage Facility being built by the DoD at the Mayak Production

Association in Ozersk, Russia, the 1996 Plutonium Production Reactor Agreement implementation, and U.S.-Russian Federation-IAEA (International Atomic Energy Agency) Trilateral Initiative negotiations.

The U.S. and Russian Federation have declared their commitment to pursuing transparent and irreversible reductions in nuclear arms. The mission of the NNSA **Warhead and Fissile Material Transparency Program** is twofold. First, we are comprehensively evaluating the impact of a warhead monitoring regime on the NNSA nuclear weapons complex, to ensure that there is no adverse impact on the U.S. requirement to maintain a safe, secure, and reliable nuclear weapons stockpile, and to ensure that no classified information is revealed. Second, NNSA experts are developing and implementing technical measures that can be applied at Russian nuclear weapons facilities, to provide confidence that Russian nuclear weapons are being dismantled, and that excess fissile materials removed from dismantled Russian nuclear weapons cannot be used again for weapons purposes. This program reduces the potential for theft and diversion of Russian warheads and fissile material, by increasing the safety and security of Russian warheads. It also obtains access to Russian scientific and technical information, and gains access and provides transparency in the Russian nuclear weapons complex.

The Warhead Safety and Security Agreement/Laboratory-to-Laboratory Transparency Program is intended to provide a greater understanding of the Russian nuclear warhead dismantlement process, while encouraging advocates for transparency in Russia. The Laboratory-to-Laboratory program is implemented through contracts signed between U.S. and Russian national laboratories. Upon receipt of deliverables from Russian institutes, U.S. laboratories provide funds to Russian scientists, who worked on the deliverables. This program is conducted under the auspices of the extended Nuclear Warhead Safety and Security Agreement. Strict guidelines and oversight are used by the U.S. and Russian Federation to ensure that only unclassified information is exchanged. Areas of work include radiation measurement technology, tags and seals, remote monitoring, and other topics related to nuclear weapons transparency.

The AAgreement between the United States of America and the Government of the Russian Federation, on the Exchange of Technical Information in the Field of Nuclear Warhead Safety and Security,@ more commonly referred to as the Warhead Safety and Security Exchange Agreement (WSSX), was signed on December 16, 1994, entered into force in June 1995, and was extended for an additional five-year term last year. Participants in the Agreement are DOE and DoD for the U.S. and MinAtom and the Ministry of Defense for Russia. The June 2000 extension incorporated any ongoing or future DOE/MinAtom Laboratory-to-Laboratory activities concerning the transparency associated with dismantlement of nuclear weapons under the WSSX Agreement. As established under the original WSSX Agreement, a Joint Steering Committee and Joint Coordinating Group approve new Laboratory-to-Laboratory topics/projects for program technical exchange consideration and provide oversight to Agreement implementation.

The Monitoring Warhead Inventories and Dismantlement Program focuses on identifying technical measures and technologies to monitor warhead inventories and dismantlement under future monitoring regimes. Future initiatives involving the monitoring of nuclear warheads, nuclear warhead dismantlement, or fissile material, resulting from dismantled nuclear warheads, will have a significant impact on the NNSA nuclear weapons complex. The NNSA Warhead and Fissile Material Transparency Program comprehensively evaluates the issues associated with potential monitoring regimes, to ensure that there is no adverse impact on the U.S. requirement to maintain a safe, secure, and reliable nuclear weapons stockpile, and that no classified information is revealed. In FY 1999, DOE and DoD agreed to combine resources in support of a joint DOE-DoD Integrated Technology Plan to comprehensively develop, test, and Ared-team@ technologies that could be used to support Mayak transparency, the U.S.-Russia-IAEA Trilateral Initiative, Plutonium Production Reactor Agreement, and potential future initiatives.

The Plutonium Production Reactor Agreement (PPRA), signed in 1996, commits the Russian government to cease production of weapon-grade plutonium at three reactors that also provide heat and electricity to two cities and their surrounding regions in Siberia. As part of the PPRA, both sides agreed to allow teams from the other side to monitor the shut-down reactors, as well as the plutonium storage facilities. NNSA and Russian technical experts are developing jointly technologies and mechanisms that will enable our monitors to perform their transparency activities, without revealing any sensitive information.

The **Trilateral Initiative** began in 1996. Its goal is to provide international confidence that excess U.S. and Russian weapons plutonium is not returned to weapon use. Technical experts from Russia, the U.S., and the International Atomic Energy Agency (IAEA) have been working diligently during the past four years to devise technologies and methods to allow IAEA verification of the material, without revealing sensitive information. IAEA inspections at the Mayak Fissile Material Storage Facility will verify that Russian excess plutonium remains removed from weapons programs. The U.S. will place its excess plutonium under IAEA verification at the K-Area Material Storage Facility at the Savannah River Site.

Non-Russia-Focused Programs

While the bulk of our nonproliferation activities take place in Russia, the NNSA is also involved in nonproliferation and arms-control-regime projects in many other parts of the world. For instance, since 1995, the U.S. and Kazakhstan have been working to reduce proliferation risks associated with three tons of weapons-grade plutonium. This material, which is located at the BN-350 fast-breeder reactor in Aktau, Kazakhstan, contains enough plutonium to manufacture hundreds of nuclear weapons. Furthermore, unlike most spent fuel, the majority the BN-350 spent fuel material poses no significant radiation hazard to a would-be thief. The project has

- reduced the threat to U. S. national security posed by the vulnerability of the weapons-grade material,
- significantly enhanced physical protection and material control measures at the plant,
- utilized a former weapons-related complex in Kazakhstan, which was converted to peaceful uses under the Cooperative Threat Reduction program, to manufacture most of the storage canisters,
- instilled a safety and security culture, by conducting all U.S.-sponsored activities in a cost effective manner, consistent with international safeguards, security, and safety standards, and
- packaged the nearly 3,000 fuel assemblies in welded and evacuated 12-ton steel canisters in such a way that Ahot@ assemblies are combined with Acool@ assemblies, to provide a radiation barrier to theft, while also stabilizing the spent fuel for long-term storage. This phase will be complete this summer, securing three metric tons of very high-grade plutonium.

The Aktau project will, as funding allows, continue to support the IAEA in the implementation of internationally accepted safeguards measures over the material, continue to provide non-weapons-related employment for nuclear scientists in Kazakhstan, and provide security and international safeguards measures for the transportation and long-term dry storage facility for the BN-350 material.

NNSA experts are also actively working in North Korea to reverse and prevent proliferation of nuclear weapons, by securing approximately thirty kilograms of weapon-grade plutonium contained in Nyongbyon 5 megawatt reactor spent fuel. Similar to the objectives of the Aktau project, NNSA technicians have

- packaged the 8,000 assemblies in canisters and placed those canisters under IAEA monitoring, and
- performed field operations to maintain packaged spent fuel in a safe condition, appropriate for future shipment.

We are also supporting the IAEA in the implementation of verification and international safeguards of the material, while helping to prepare plans to support future shipment and disposition of spent fuel.

In an effort to impede the use of weapons of mass destruction, the NNSA supports several projects targeted at reducing the amount of fissile material that could be available to potential proliferators to fashion into a nuclear device. In the Reduced Enrichment for Research and Test Reactors (RERTR) Program, NNSA continues to work to reduce international commerce in civil HEU, by developing technologies to convert foreign and domestic research and test reactors from HEU to LEU. To accomplish this, the program continues to

- develop denser LEU fuels that can be used to convert most, if not all, research reactors to LEU fuel,
- develop LEU targets and chemical processing methods that can be used for production of medical radioisotopes,
- perform design and safety analyses, and transfer technology to assist conversion of research reactors to use of to LEU fuel and targets; and
- provide support to the Russian RERTR program, to develop high-density fuels and to complete the design and safety analyses needed for LEU conversion of Russian-designed research reactors.

Along those same lines, and based on its own experience with the RERTR program, NNSA experts have begun cooperation with Russia to establish a Research Reactor Fuel Take-Back Program, to prevent proliferation of nuclear weapons, by repatriating to Russia civil HEU fuel, from Soviet/Russian-supplied research reactors in sixteen countries, many of which are located in regions of proliferation concern. This program is in its early stages, and is working closely with the IAEA.

NNSA is also active in strengthening regional security and nonproliferation, not only on the Korean peninsula, but also throughout East Asia, South Asia, and the Middle East. We are doing this by participating in U.S. policymaking, promoting regional security dialogues, and sharing with key states in these regions the expertise of the national laboratories on technical measures to implement nonproliferation agreements. Under a program to strengthen the Biological and Toxin Weapons Convention (BWC) regime, NNSA supports the U.S. in its efforts to negotiate a legally binding protocol to the 1972 BWC. This protocol is part of a larger effort to deter noncompliance with the BWC and to reinforce the global norm against the proliferation of biological weapons. Our technical experts facilitate U.S. commerce through implementation of bilateral peaceful nuclear cooperation agreements with our nuclear trading partners.

GOAL 4: PROVIDING NAVAL NUCLEAR REACTORS

Our fourth goal is to provide the Navy with safe, militarily effective nuclear propulsion plants, and ensure their continued safe and reliable operation.

Naval Reactors is a highly successful semi-autonomous organization inside of the NNSA. Admiral Bowman, the Program=s director, is responsible for providing the U.S. Navy with safe, militarily effective nuclear propulsion plants, and ensuring their continued safe and reliable operation.

The responsibilities and authority of the Director of this unique dual agency organization were set forth in Executive Order and in Public Laws. This cradle-to-grave responsibility begins with technology development and continues through reactor operation and, ultimately, reactor plant disposal.

With 102 operating Naval reactor plants in warships comprising forty percent of the Navy=s major combatants, primary emphasis and most effort is placed on ensuring the safety and reliability of these plants. Naval Reactors is developing the next-generation reactor for the Navy=s new VIRGINIA-class attack submarines and a reactor for the Navy=s new CVNX class of aircraft carriers.

I will continue to support and promote this unique Program that produces the Aculture of excellence@ that NR is known for.

GOAL 5: VITALITY AND READINESS OF THE NNSA ENTERPRISE

Our fifth goal is to ensure the vitality and readiness of the NNSA=s scientific and technical enterprise, for the next decade and beyond. We are particularly concerned about attracting and retaining a preeminent workforce and revitalizing our aging infrastructure.

Nuclear Expertise

A key strategy for ensuring the readiness of the enterprise is to attract and retain the best workforce possible, in today=s highly competitive market for technical talent, by providing a challenging and rewarding work environment. Within a decade, most of our weapons designers with nuclear testing experience will be eligible for retirement and may have left our workforce. This means that when our newest system, the W88, reaches the end of its original, expected design life in 2014, we may no longer have anyone with test-based job experience to help evaluate modifications that may be required, due to aging. As part of the Stockpile Stewardship Program, we are using the remaining critical staff to train and mentor the next generation of stockpile stewards, who will use the new stockpile stewardship tools, along with existing nuclear test data and the weaponization database.

As I indicated in the beginning of this testimony, our people are our most important asset. But our experienced cadre of scientists, engineers, and manufacturing personnel is dwindling, as workers retire. Attracting and retaining the critically skilled people we need is one of the major problems faced by the nuclear weapons complex today.

We provided a report to Congress last year, in response to section 3163 of the National Defense Authorization Act for Fiscal Year 2000, that describes the situation at each of our contractor sites, with regard to their current and projected critical skills status and their plans for maintaining essential nuclear weapons expertise. At present, we believe the situation is manageable, but we will carefully monitor the implementation of each site plan. We are also currently reviewing our policy with our management and operating contractors to ensure that it promotes effective recruitment and retention. The three new contracts with our production plants, awarded in FY

2000, contain a new clause that states it is our policy not to inhibit recruitment and retention. The new contracts with the University of California for the Los Alamos and Lawrence Livermore National Laboratories include maintenance of critical skills as one of the key improvement areas that will receive focused evaluation by the NNSA.

One might think that recruiting and retaining the critically skilled people we need could be solved by simply paying higher salaries. Certainly that is true in some instances, but not all. One of the problems in cyber security is that once we have trained individuals in the latest techniques, we often lose them to private industries that are paying higher salaries. Of course, a number of the critically skilled people that are needed in the complex have less direct application in private industry, for example, plutonium metallurgists. This raises the problem of encouraging individuals to enter these fields in the first place, and it is here that our new experimental facilities and capabilities come into play.

A significant element in attracting and retaining personnel at the national defense laboratories has always been the Laboratory-Directed Research and Development (LDRD) Program. I would like to thank Congress for removing the restrictions against allowing our contractors to set aside up to six percent of their weapons activities appropriations for Laboratory-Directed Research and Development. The central objective of the LDRD program is to enhance the scientific and technical capabilities of the national laboratories, by investing in fundamental science and technology to meet long-term national needs. Sustained support for this program is essential, as it impacts recruitment. Overall, the personnel pool is still low which reflects the time it takes to recruit individuals. A similar program, authorized by Congress for the production plants, began in FY 2001.

Although Laboratory and Plant Manager Directed Research and Development Programs are essential elements in attracting people to the nuclear weapons program, the enduring attraction and retention of these people is fundamentally related to three issues: national importance of the mission, technical challenge of the program and advanced experimental, computational, and manufacturing capabilities.

Maintenance of the Complex

Another key strategy for assuring the vitality of our enterprise is to provide state-of-the-art scientific and technical tools and facilities, in a safe and secure environment. The current budget request for FY 2002 will provide approximately the same level of funding available to our facilities and sites, as it has during the past several years. As I indicated in my testimony before the Senate Energy and Water Development Appropriations Subcommittee on March 13th, that level of funding has focused maintenance activities each year on those facilities necessary to carry out the immediate workload. We have not been able to make a significant investment for sustained, preventive maintenance or investments to reduce the risk of equipment failures, to increase operational efficiency and effectiveness, or to extend facility lifetimes. As a

result, our aging nuclear weapons complex – more than half of our structures are greater than fifty years old – is deteriorating at an accelerating rate. The assessment Defense Programs conducted last year indicated that, in just the last five years, the percent of the complex found to be in either excellent or good condition had fallen from roughly 56 percent to only 26 percent.

The condition of our facilities and infrastructure is certainly not a new story, having been documented in a number of studies over the past decade, and addressed by various construction-oriented initiatives, including Utilities and Equipment Restoration, the Facilities Capability Assurance Program, R&D Revitalization, Non-Nuclear Reconfiguration, and the Stockpile Management Restructuring Initiative, during the past three decades. The condition of our facilities and infrastructure has also been recognized by Congress, which, since FY 1998, has earmarked $86 million above requested levels, specifically for infrastructure improvements at Y-12, Pantex, Kansas City, and Savannah River. Certainly, increased funding is vital, but it is only one part of the solution. Excellent facility management is a standard business practice of most major organizations and I have already taken steps to establish an office within NNSA to manage the facilities and infrastructure of the nuclear weapons complex. This office will focus on long-term planning, establishing the processes **B** absent too long **B** that will institutionalize the procedures, standards, and expectations for the complex.

A Recapitalization Initiative has been developed to redress infrastructure problems throughout the complex in response to a recent comprehensive study of facilities and infrastructure. This multi-year initiative to correct maintenance deficiencies, with the goals of stabilizing the infrastructure, increasing availability of our current facilities, and extending their useful lives will be reviewed as part of the strategic review of national security programs.

GOAL 6: CREATING A WELL-MANAGED ORGANIZATION

Our sixth goal is to create a well-managed, responsive and accountable organization, by employing effective business practices. On March 14, 2001, I announced my plans for realigning the NNSA=s organizational structure to improve performance of our core mission of strengthening national security and reducing the global threat from weapons of mass destruction, through applications of science and technology.

This past January, after listening to the findings of my two organizational options teams, I concluded that NNSA should be realigned into "product" and "support" divisions, as is the practice in many major private sector enterprises.

Our "product" divisions, Defense Programs and Defense Nuclear Nonproliferation, will focus on defining and advocating for the most effective means of accomplishing our mission. On the other hand, key support functions have received less-than-adequate attention in the past. Security and safety management, infrastructure and project management, the personnel system, and the

planning and budgeting process all need focus and dedicated management attention. In creating two new Associate Administrators, one focused on facilities and operations and the other on management and administration, we will establish the advocates for many of the functions that the Congress recognized as needing attention in the crafting of Title 32. By taking these functions off the plates of my Deputy Administrators, I am freeing these managers to focus more intensively on program concerns and mission accomplishment.

We have no intention of realigning Naval Reactors within this reorganization – they will remain separately managed as specified in Title 32. We have made use of this program=s record of success and their many lessons-learned in the shaping of the NNSA.

The two new Associate Administrators will support the mission organizations. The Associate Administrator for Management and Administration will be tasked to ensure efficient management of budget, finance, procurement, information, and people, to make them serve the needs of the product divisions. The Associate Administrator for Facilities and Operations will ensure responsible stewardship of our facilities and will be successful only if these facilities are available to the program organizations for performing our missions. These changes are designed to consolidate responsibility for security, safety, and environmental issues at NNSA sites; to establish clear and direct lines of communication for laboratory directors and plant managers; establish greater personal accountability; and to improve productivity and morale.

The Deputy Administrator for Defense Programs will focus on maintaining the safety, security, and reliability of the nuclear stockpile. Significant strides have been made in that area with the Department of Defense, in that we are implementing plans for detailed, requirements-driven stockpile life extension and refurbishment. Defense Programs will direct planning and set goals for production at the plants and for the science-based stockpile stewardship activities at the national laboratories. Defense Programs will retain responsibility for major program-oriented construction and facility initiatives.

The Defense Nuclear Nonproliferation organization will continue to reduce the threats posed by weapons of mass destruction, strengthen nonproliferation institutions and norms, develop technologies to prevent nuclear smuggling, detect proliferation, respond to possible chemical or biological weapons use, and reduce the danger posed by unsafe operation of Soviet designed reactors worldwide.

I recognize that establishing these “product” and “support” divisions creates a degree of tension within the organization, but I expect that this tension will evolve into cooperation and support as each element begins to work with the others to accomplish our mission. This organizational structure works, if we are able to adopt a corporate approach to accomplishing the mission. Each Deputy and Associate Administrator must recognize that their personal and organizational success is tied to the success of the overall organization. We are creating a Management Council consisting of

the Deputies and Associates that will be tasked with resolving cross-cutting issues and disputes. These issues will be referred to the Administrator, only if the Council cannot resolve them. Also, I will seek establishment of a Principal Deputy Administrator to help me resolve operational issues among NNSA elements and to assist in the day-to-day management of the enterprise. In sum, we are trying to develop a corporate approach to decision making.

Mindful of the legislative mandate to provide the Armed Service Committees with a plan by May 1, 2001, "for assigning roles and responsibilities to and among the headquarters and field organizational units of the NNSA," we divided the effort into two phases. The first phase addressed headquarters elements. In January, we assembled ten teams to tackle these issues for the headquarters elements. The reports of these teams formed the basis for our headquarters reorganization. The May 3, 2001 ***Report to Congress on the Plan for Organizing the National Nuclear Security Administration*** is the first step in a multiphased effort, and includes mission and function statements for each major element of our realigned headquarters organization; it describes relationships between each NNSA element; and discusses relationships between NNSA elements and those organizations external to the NNSA. The report contains a plan for making this organizational transition by October 1, 2001, describes changes to organizational units and a strategy for making the staffing transition. A report on the second phase will be transmitted to Congress in October. I have made a commitment that, in this initial reorganization phase, everyone currently employed will either be retained in a job similar to their current position or be placed in a new job within NNSA. We need to retain our federal talent for this to be a success!

Realigning the field structure is the second phase of our efforts to establish an effective and efficient NNSA enterprise. Our May 3rd plan includes a design outline for allocating roles and responsibilities between headquarters and the field. As the next step, I intend to charter a neutral group of experts to advise me on options for addressing key structural issues uncovered in by previous studies of this issue. This group will be asked to gather information and develop options over the next three months, with a view to resolving field-structure issues by the end of the year.

My focus in these organizational adjustments is on making measured, thoughtful changes that improve NNSA=s effectiveness in accomplishing our mission and then seeking to improve our efficiency through a structured process that does not disrupt current mission performance.

Detailed Budget Proposals and Multi-Year Plans

One of the key strategies for creating a well-managed organization is to adopt an integrated business management system that links strategic planning, programming, budgeting, execution, and evaluation. On the budgeting front, the good news is that NNSA submitted a Future-Years Nuclear Security Budget to the Office of Management and Budget (OMB) on March 2, 2001. OMB intends to carefully evaluate our future-year budget, over the next few months, in conjunction with the Administration=s strategic review.

Internally, our focus within NNSA is on improving our planning, programming, budgeting, and execution (PPBE) process. Our first future-year budget request was constructed while we began to implement a systematic process for connecting and integrating our plans, programs, funding requests, and performance evaluation processes. At the moment, these processes are not as well synchronized as we want. We expect that the FY 2003 budget process will be a transition year in our implementation of a PPBE system. The system should be fully implemented during the FY 2004 process. The graphic attached to my testimony presents a picture of how we expect the process to operate when the system is fully implemented.

The NNSA PPBE system will (1) establish standardized business management processes where feasible and will provide flexibility for programs as appropriate; (2) improve discipline in program and project management; (3) assure that each program and project receives appropriate consideration as tradeoffs are made in establishing the integrated budget; and (4) create meaningful performance measurement and feedback systems. We hope to demonstrate the value of this system through measurable improvement in our mission performance.

The system is divided into four phases:

1. Long-Range Planning **B** for the FY 2004 cycle, this will be performed between June and October of FY 2001.

2. Programming **B** guidance for FY 2004 will be issued early in 2002, and program decisions will be reached by June 2002.

3. Budgeting **B** NNSA senior managers will review the budget in June or July of 2002 and will then participate in the Department=s process, tied to the preparation of the President=s budget, which is released in January or February of 2003.

4. Execution and Evaluation **B** execution year funding will cascade down through program and implementation plans. Program managers will perform periodic reviews and report the results to appropriate officials.

With the help of the Institute for Defense Analysis, NNSA has developed a detailed plan for implementing this system. NNSA=s near-term priorities include:

- **$** communicating our plans throughout our enterprise,
- **$** establishing and implementing an Integrated Priority List and resource prioritization process,
- **$** improving the quality, timeliness, and integration of future-year program and implementation plans,
- **$** establishing and implementing a formal change control process,

- conducting periodic, formal evaluations, and
- reviewing and establishing NNSA information technology requirements for the process.

Development of a future-years defense budget process that brings us more in line with the needs of our missions, plants, and national laboratories is an important step. We have established momentum toward reaching that goal and we are making slow but steady progress. Your continued support for our efforts will be needed to reach this objective.

Improving Personnel Management

Another key strategy for improving business processes is to stress accountability at all levels of the organization. We must hold managers and contractors accountable for program and service results, hold individuals accountable for meeting performance goals, and reward individuals, units, and contractors accordingly. Finally, we must foster an orientation toward self-development.

Title 32 contains limited, but important authority for the NNSA Administrator to begin revitalizing the Federal staffing of our nation=s nuclear security enterprise. Review of our interim policy for implementing excepted service appointments and compensation authority for no more than 300 scientific, engineering, and technical positions within the NNSA is nearly completed. We expect to begin exercising this authority by the beginning of July 2001.

The policy was developed by NNSA staff, in consultation with other agencies, that use similar authorities. Indeed, our team leader was the architect and implementer of the excepted service authority granted to the Defense Nuclear Facilities Safety Board by Congress. His expert advice was invaluable in establishing this interim policy.

Our interim policy is designed to provide NNSA managers with sufficient flexibility to attract and retain key personnel needed to meet our demanding mission, while ensuring that NNSA uses this special authority with due regard for the Merit Systems principles of federal personnel management. An integral element of the policy is the Pay-For-Performance feature, allowing for performance increases and performance bonus pools. Implementation of this Pay-For-Performance feature will be deferred until a uniform performance appraisal system can be established for our excepted service employees, and until our managers can be trained to develop fair and accurate measures of staff performance.

We see this interim policy as just the first step in revitalizing our federal staffing process. We urgently need to begin hiring staff at entry and mid-career tiers to avoid future gaps in staffing and leadership. As you may be aware, almost fifty percent of our staff is within a decade of retirement.

CONCLUSION

I believe that NNSA is on the right course. The NNSA enjoys the support and endorsement of Secretary of Energy Spencer Abraham. It is the right idea to bring together the national security missions of DOE, and to focus our work with clear goals and plans, clean lines of authority, and a strong view to the future. We are on a good path to improve on our management and performance, to manage our programs efficiently and effectively, and to plan our future.

The culmination of all the stockpile stewardship activity – of all our surveillance, maintenance, refurbishment, research and development, and construction – is annual certification of the stockpile. The Stockpile Stewardship Program has, for the past five years, given the Secretaries of Energy and Defense the necessary confidence to inform the President that a return to nuclear testing is not required to maintain the safety, security, and reliability of the nuclear weapons stockpile. With appropriate resources, we will be able to continue to provide that confidence for the foreseeable future, maintaining a credible nuclear deterrent for as long as we should need it.

This confidence – and I cannot emphasize this enough – is largely the product of expert judgment, the expert judgment of some of America=s best and brightest men and women, in both federal service and throughout the nation in our laboratories and plants. Their judgment is only meaningful because of their experience in pursuing the highest standards of excellence in science, engineering, manufacturing, and management. If we offer these people anything less – if we continue asking some to work in substandard facilities with aging equipment, if we burden them with unnecessary bureaucratic requirements and politics, if we fail to give them challenging work – then they will go elsewhere, our confidence in our weapons will suffer, and, under such circumstances, our nuclear deterrence will fail.

The scientists and engineers that are stewards of our nuclear arsenal have also been making important technical contributions to controlling, detecting, and deterring the use of weapons of mass destruction. NNSA's unique contribution is evident in the caliber of personnel working on these complex, interrelated threat reduction programs. Their expertise resident in our national laboratories has been honed by years of working in support of the U.S. nuclear complex. Our technical experts are ready and willing to share their nonproliferation and counterproliferation experience with their counterparts in Russia. Mr. Chairman and members of this Committee, I think we can all agree that as a nation, we may face no greater challenge than preventing weapons or weapons usable materials from falling into the hands of those who would use them against the U.S. or our allies. It has been more than a decade since the Berlin Wall fell, opening a new era in history. In many ways, we live in a more dangerous world now, since the demise of the Soviet Union. The threat to our safety and international security is more diffuse, which makes it harder to defend against. Rather than one monolithic threat, we must be prepared against rogue nations or terrorist organizations with interests inimical to ours. I am very proud of the nonproliferation programs that are rightfully part of the defense nuclear security enterprise. The review being conducted at the present time by the

White House is timely and I am confident it will reveal that the NNSA=s programs are making solid contributions to the national security of the United States.

Again, I thank the members of this Panel for their commitment and support of our mission, and for your support of the people of NNSA who actually do the work and accomplish the mission: scientists, engineers, technicians, policy planners, administrators **B** at headquarters, in the field, at our laboratories, plants and the test site.

Simply stated, NNSA has great people and a great mission. Thank you again for the opportunity to appear here today.